

Seed tapes contg. accurately spaced seeds

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Abstract of DE19503971

Seed tapes are made by placing single seeds (19) by means of a dosing arrangement (4) into locally delimited regions (21) on a base layer (50) and covering the base layer (50) with a covering layer (3). Also claimed is equipment for carrying out the process in a continuous conveying plane (T) and forwarding (24) the covered tape to a second zone where the layers are mechanically bonded. Pref. tapes are made of biodegradable material, esp. needle punched non-woven of a 50/50 mixt. of flax/cotton or hemp/cotton or blends including viscose. A spacing layer (2) with accurate perforations (21) is placed on a base layer (50). Single seeds are deposited by a swinging dosing device (4) which draws in seeds pneumatically and puts them into the pockets with a reciprocating plunger (23). The cover layer (3) is compacted by pressure bands (24) and needle punched (5) in the spaces between the seeds to the other layers (1,2). The tape is then cut longitudinally (9) and transversely (11) as required. The draw-off rollers (6,12) have grooves to avoid crushing the seeds.

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The available invention concerns a procedure and a device for the production of a seed volume.

Seed volumes are consulted usually to facilitate the yield of individual grains both by machine and manually strongly. From the DE-GM 89 11 056 for example a seed volume is well-known, which exhibits two natural fiber layers, in particular jute layers, between which a reinforcement fabric for the situation adjustment of the seed property is brought in. Process engineering this seed volume is manufactured by presenting the reinforcement fabric on a first nature fleece, whereby then the seed property up-strewn, with which second nature fleece is covered and connected by ennobling mechanically.

At this manufacturing process it is unfavorable that the seed property file takes place coincidence conditionally by scattering, so that the distance is irregular between grains. Thus the grains can together-lie closely, whereby Krüppel or small stature is caused. Additionally coincidence-cause resting upon grains know by unawareness their accurate situation during the ennobling to be damaged.

The available invention has to therefore make the task available a procedure for the production of a seed volume, with which the grains fixed in vorgebenen distance positively into a seed volume layer one brings automatically individually and purposefully. Furthermore a further task of the invention exists in the supply of a simple and nevertheless effective device for the execution of the procedure.

This task becomes regarding procedure by the characteristics of the requirement 1 and regarding the device by the characteristics of the requirement 10.

The seed volume is supplied according to invention process engineering thereby manufactured that one with ranges to the located, in particular surface-defined admission of seeds provided base layer to a single grain dosing apparatus, the seeds into the ranges of the base layer are inserted and the base layer equipped with the seeds is covered with a surface layer. The seeds are purposefully inserted by the single grain dosing apparatus automatically and. Since the base layer of ranges exhibits, within which the seeds are located stored, can the distance of the grains be varied and the germ ability co-ordinated. A reinforcement fabric actual as necessary in the well-known case necessarily - thus no longer. Taking the base layer off equipped with the seeds makes a positive adjustment possible of the seeds, whereby also a over head situation of the seed volume can change the position of the grains not substantially. By situation knowledge of the grains can in addition needle zones to be specified, so that a damage of the grains can be excluded.

In accordance with requirement 2 if a base layer consisting of a base and a perforated spacer layer is supplied to the single grain dosing apparatus, then by the functional allocation it is made possible that the spacer layer must be only worked on or a spacer layer already perforated can be used. Likewise the strength of the seed federation can be varied with this spacer layer.

& top A simple working on step for the production of the ranges in the base layer can be obtained in accordance with requirement 3 by punching out.

If the base layer covered with the surface layer is consolidated in accordance with requirement 4, then by the surface pressure an adhering of both layers is obtained, whereby a reforwarding of the layer group is supported.

In order the individual layers of the seed volume in accordance with requirement 5 to completely prevent, they solve a lot are with one another ennobled. With this solidification method the individual layers become by a multiplicity of needles, so-called felt needles, durchstoehen. The felt needles are made possible for the fiber layer which can be punctured at their work shanks with grooves (reverse Widerhaken) equipped, the one fiber admission and thus a fiber transport. When vertical puncturing of horizontal running fiber layers fibers from their horizontal situation in their vertical situation are therefore reoriented. The density in the fiber layer effectuation in connection with the trained fiber beard/fiber loops the solidification in the form of rubbing and this, rising thereby, purely mechanical procedure for the solidification is therefore to be called pollution free.

If the base layer and the surface layer are cut in accordance with requirement 6 in longitudinal direction, then several seed volumes with identical layer structure can be produced in a manufacture course.

In favourable way in accordance with requirement 7 by rolling up on roles or cases the condition for the transport of the seed volume for the appropriate places of work is created.

If the further transport of the seed volume takes place in accordance with requirement 8 cyclically, then punching out the located ranges into the clock tracing both, whose assembly with seeds grains are accomplished by means of the single grain dosing apparatus and the mutual solidification of the layers by ennobling, can.

By the use of natural fiber in accordance with requirement 9, in connection with the mechanical solidification of the layers by ennobling, a seed volume is preferably manufactured in a simple manner, which is environmentalcompatible

and can thus after the yield in the open land in the soil remain if necessary. All layers according to invention of the seed volume manufactured with the procedure can be manufactured either on separate plants and supplied to the single dosage apparatus or be upstream however as independent process step into the procedure according to invention integrated and the production of the ranges as well as the supply of the base layer to the single dosing apparatus. For the production of the seed volume according to invention the composition is fundamental and/or. Mixing of all fiber conceivable, those are rotatable for this count both the vegetable and the animal natural fiber, however also chemical fibres from natural polymers, as for example viscose rayon fiber and/or. zellulosische fibers. Beside the red barness it should to the fact be paid attention that the fiber exhibits the necessary water absorption ability and Wasserrückhaltevermögen, in order to favour the germ process. Furthermore it should be considered that the seed volume from very light materials is developed, in particular needle bonded fabrics, whereby a high fine fiber portion is suitable better, in order to manufacture a sufficiently close and firm layer group. As favorable Fasermischungen therefore flax/cotton (50%/50%) can; Hemp/cotton (50%/50%); Flax/jute/cotton (40%/20%/40%); Flax/viscose rayon as well as Baunwolle/viscose rayon or other combinations of the synthetic materials mentioned than are regarded favourably

Furthermore according to invention according to requirement 10 a device is created for the production of a seed volume, with which the base layer in one transportation level is led and a single dosing apparatus to inserting the seed property goods, a first zone to the Doublieren the seed volume forming layers, at least to the reforwarding of the layers of the seed volume, preferably in the first zone arranged one conveyor, and a second zone exhibits, in which the layer group is mechanically interconnected, so that the seeds grains inserted into the base layer also in over head situation the pre-determined ranges to the located, in particular surface-defined admission not leave cannot as well as the reforwarding of the mechanically connected layer group is supported. With this device according to invention bringing in the Saatkörner up-simple Wei automatically, one aims and for the Saatkörner damage-free as well as with a small error rate and/or. False assembly accomplished, there the situation of the ranges for the located admission of the seeds grains during the entire manufacture procedure admits is and/or. to be supervised can. Furthermore the seeds distance can be steered over the ranges to the located admission of the seeds and be varied thus over the length and width of the seed volume at will.

If the device according to invention exhibits a third zone, in which the layer federation is cut in longitudinal direction by means of at least one cutting tool in accordance with requirement 11, then several seed volumes with identical layer structure can be produced in a manufacture course.

Because in accordance with requirement 12 at least two transportation volumes are intended, which are arranged above and below the transportation level preferably and function if necessary at the same time as compression volumes in a simple manner the further transport of the layer group supported and prevents a shifting and a vibrating of the individual layers.

In accordance with requirement 13 in the second zone if a needle mechanism is planned, then the layer group is mechanically stabilized badly each other by responsible layers, without having to use for this further bonding agents, in particular chemical binding memos. The needle mechanism points in accordance with requirement 14 with needles and/or. Felt needles equipped needle board and/or in accordance with requirement 15 at least one needle plate up, with the number of needles in the needle board is co-ordinated whose passages. The needle plate serves to prevent the taking along of the layer group due to the retrograde movement of the needles in the needle board after puncturing.

If a needle plate is arranged above and below the transportation level leading the layer group in each case in accordance with requirement 16, then the layer group is reciprocally supported during puncturing. Thus also a layer group is producible by ennobling, which a small natural stability exhibits.

If the needle plates are movably trained in accordance with requirement 17 vertically, then becomes one in horizontal direction carried, particularly soft layer group together by vertical brought the needle plate before puncturing lent at short notice and during puncturing a sufficient stability. For the distortion-free further transport of the layer group the needle plates are again sufficiently taken off.

In order to prevent a damage of the seeds during the ennobling, in accordance with requirement 18 the number and situation of needles in the needle board are co-ordinated in such a way with the ranges planned for the located admission of the seeds that the ennobling of the layers takes place only in the seeds-free ranges.

The training of the single grain dosing apparatus in accordance with requirement 19 makes in a simple manner an automatic and purposeful bringing in possible of the seeds preferably into the base layer of the seed volume.

The third zone exhibits one departure roller at least in accordance with requirement 20 second and/or, then the further transport of the layer group is supported in favourable way.

In order to also protect the seeds grain in the seed volumes to small fiber layer strength from crushing by the departure rollers, the lateral surface of the departure roller exhibits 21 slots, which in would face itself to the seed-equipped ranges of the seed volume find in accordance with requirement. A maximum wedging of the fiber layers for the secured material departure can be ensured by this constructional measure by the departure roller.

In accordance with requirement 22 the condition for the transport of the seed volume in different lengths for the appropriate places of work is created in a simple manner.

If a punching mechanism the single grain dosing apparatus becomes upstream in accordance with requirement 23, then the processing step of the production from ranges is integrated to the located admission of the seeds into the production of the seed volume and a rough base layer can be supplied to the device according to invention. In the case, if a spacer layer of the punching mechanism locates the seed property for production taking up ranges in accordance with requirement 24 is supplied and later for the training of the base layer on a base applied, thus a variable organization of the seed volume is in particular regarding different fiber layers and/or. - mixtures and if necessary fiber densities given.

Takes place the further transport of the layer group and/or. the base layer cyclically, then a single grain dosing apparatus, if necessary a punching mechanism, can be one needle-furnished and a separating equipment situation-fixed

in each case in the device according to invention arranged, which are brought in each case into the clock tracing to the employment. The clocking feed motion, which is released for example by the departure rollers, is on the distance of the ranges to the located admission of the seeds and/or. Perforation distance of the spacer layer adjustable, so that the fiber layers are always briefly stopped if itself the range of the basis and/or. Spacer layer accurately below the single grain dosing apparatus finds.

If variable adjustable cutting tools are intended in accordance with requirement 26, several seed volumes with different widths in only one manufacture course can be produced.

Far ones favourable training further of the invention are the subject of the remaining Unteransprüche.

For illustration on the basis a remark example the invention under consulting the design is described and sews described. It shows

Fig. 1 a schematic side view of an execution form of the device according to invention;

Fig. 2 a schematic cross section opinion along the line of A-B of the device according to invention;

Fig. 3 a schematic cross section opinion along the line CD of the device according to invention; and

Fig. 4 schematically a material intake also into the device according to invention integrated automatic punching machine.

As in Fig. 1 shown, exhibits the device according to invention one transportation level T, in which a base layer 50 consisting of a base 1 and a perforated spacer layer 2 is supplied to a single grain dosing apparatus 4, which inserts individual seeds grains into the ranges 21 planned in the base layer 50 for the located admission of the seeds 19, in which preferably the single grain dosing apparatus 4 arranged in a first zone 1 is preferably tiltable out-arranged and in the lagging a grain sucks in by means of a suction nozzle 22 and inserts by a tappet 23 into the pre-determined ranges 21 of the base layer. In Fig. 1 represented device according to invention exhibits two spacervariable compression volumes 24 above and below the transportation level T, which - if necessary - takes over also the further transport of the base layer 50 and a surface layer 3 brought in after the single grain dosing apparatus 4 from above over roles of 52 between the compression volumes 24. After the grains 19 by the surface layer 3 inserted in the range 21 are taken off, in such a way formed layer group according to invention of a needle mechanism 5 in a second zone 11 of the device is supplied. In Fig. 1 needle mechanism shown 5 takes place the mechanical layer group, z. B. by one-sided ennobling from above. The function mode and arrangement of the needle mechanism are in Fig. 2 clearly emphasized. The needle mechanism 5 exhibits a needle board 15, in such a way with needles and/or. Felt needles 16 it is equipped that in material putting in the range of the grains 19 needle-free lanes remain. Furthermore the needle mechanism exhibits needle plates 17, 18, whereby the ennobling of the fiber layers of the seed volume between the needle plates 17, 18 takes place only in the seeds-free range, whereby puncturing and/or. Damage the grains 19 one prevents. In order to obtain a small number of cycles however high transportation speed of the seed volume, know - as in Fig. 1 represented - several Nadelreihen one behind the other arranged its, whereby it is to be only made sure that those felt - and/or. Solidification needles 16 only outside of the seed-prominent ranges work. That means also in Transportrich < DP N=11 > tung it is to be made certain that an appropriate needle-free zone should be present in the needle board. If the exclusive transportation function is not assigned to the compression volumes 24, then for example 6 for example above the transportation level T with an appropriate resting upon roller 7 below the transportation level T the further transport - further transport also clocked - of the layer group can transfer to transportation direction regarded after the needle mechanism 5 a departure roller. In order to prevent, both the resting upon roller 7 and the departure roller 6 on their lateral surfaces are provided crimpings of the grains 19 with slots, which in would face itself to the seed property equipped ranges of the seed volume find. Also then - as in Fig. 3 more clearly emphasized - only the departure roller 6 the slots exhibit, in order to prevent a crushing of the grains 19. After the pair of departure rollers 6, 7 is in in Fig. 1 represented execution form of the device according to invention in a third zone III a cutting tool 9 in form of an adjustable squeezing measurer arranged that cutting arbitrarily broad seed volumes on a gumption wave makes 10 possible within the range of the needle zones. The further transport of in such a way cut seed volumes can be made again by a further pair of departure rollers 12, 13, which is likewise in the third zone III arranged, their arrangement the pair of departure rollers 6, 7 resembles. Become as in Fig. 1 represented, into the width cut seed volumes on a case and/or. rolled special angle disks up 14, then the length of the seed volumes can be partitioned depending upon need by a separating equipment 11. Becomes as in Fig. 4 shown, the single grain dosing apparatus 4 an automatic punching machine and/or. - mechanism 20 upstream, then is made possible with this measure to integrate the separate processing step of perforating the spacer layer 2 into the manufacturing process for seed volumes. For this the spacer layer 2 is only supplied to the automatic punching machine 20 by way of guide rollers 56 to each other preferably in the transportation level, punched out depending upon size and distance and/or. break through and then on one from downside over roles of 58 supplied base 1 applied, which form then the base layer 52 with ranges for the located admission of the Saatkörner.

The invention creates thus a procedure and a device for the production of a seed volume, with that and/or. to the one mechanical connections by mechanically before-solidified fiber layers, in particular by ennobling, in combination with an automatic supply of individual grains, whereby a positive adjustment of the seeds which can be brought in is ensured when simultaneous adherence to a given seed distance, all material-prominent and working on device construction units is so out-arranged that a damage of the seeds is prevented, the seeds distance over the length and width of the seed volume is made available arbitrarily variable is trained, by the layer structure also different materials types, material densities in the seed volume realized, different kinds of seeds over the length and width of the seed volume and different to be manufactured seed-volume-broadly to be able.



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1. Procedure for the production of a seed volume with the following process steps:

- a) Supplies one with ranges (21) to the located, in particular surface-defined admission of seeds (19) provided base layer (50) to a single grain dosing apparatus (4);
- b) Insert the seeds (19) into the ranges of the base layer (50); as well as
- c) Take off the base layer (50) with a surface layer (3), equipped with the seeds (19).

2. Procedure according to requirement 1, by the fact characterized that one is supplied to the single grain dosing apparatus (4) from a base (1) and a perforated spacer layer (2) existing base layer (50).

3. Procedure after one of the requirements 1 or 2, by the fact characterized that the ranges (21) of the base layer (50) are punched out.

4. Verfahren after one of the requirements 1 to 3, by the fact characterized that the base layer (50), covered with the surface layer (3), is consolidated.

5. Procedure after one of the requirements 1 to 4, by the fact characterized that the surface layer (3) and the base layer (50) are ennobled with one another.

6. Procedure after one of the requirements 1 to 5, by the fact characterized that the base layer (50) in longitudinal direction, covered with the surface layer (3), is cut.

7. Procedure after one of the requirements 1 to 6, by the fact characterized that the base layer (50), covered with the surface layer (3), is rolled up and cut off depending upon length.

8. Procedure after one of the requirements 1 to 7, by the fact characterized that the further transport takes place cyclically.

9. Verfahren after one of the requirements 1 to 8, by the fact characterized that as layers of the seed volume natural fibers, in particular flax, hemp, cotton and jute and/or chemical fibres, in particular from natural polymers such as viscose rayon fibers or other zellulosische fibers are used.

10. Device for the production of a seed volume, in particular using the procedure in accordance with one of the requirements 1 bi 9, characterized through

- a) one transportation level (T), in which one with certain ranges (21) to the located, preferably surface-defined admission of the seeds (19) intended base layer (50) one leads;
- b) a single grain dosing apparatus (4), the base layer (50) with seeds (19) equips;
- c) a first zone, in which the base layer (40) will provide with a surface layer (3), whereby a layer group forms;
- d) at least one conveyor (24), that the base layer (50) and/or. the layer group carries on;
- e) a second zone, in which the layer group is mechanically connected;

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11. Device according to requirement 10, characterized by a third zone, in which the layer group is cut by means of at least one cut tool (9) in longitudinal direction.

12. Device according to requirement 10 or 11, by the fact characterized that at least two transportation volumes (24) are intended, which are arranged above and below the transportation level (T) and function at the same time as compression volumes.

13. Device after one of the requirements 10 to by the fact 12 characterized that in the second zone a needle mechanism (5) is intended.

14. Vorrichtung after one of the requirements 10 or 13, by the fact characterized that the needle mechanism (5) exhibits at least one needle board (15).

15. Device after one of the requirements 10 to 14, by the fact characterized that the needle mechanism (5) exhibits at least one needle plate (17).

16. Device after one of the requirements 10 to 15, by the fact characterized that a needle plate (17) is arranged above and below the transportation level (T) in each case.

17. Device according to requirement 16, by the fact characterized that the needle plate (17) is vertically movable.

18. Vorrichtung after one of the requirements 15 to 17, by the fact characterized that the number and situation of needles (16) are co-ordinated in the needle board (15) like that with the ranges (21), intended for the located admission

of the seeds (19) that the ennobling of the layers takes place only in the seeds-free ranges (21).

19. Device after one of the requirements 10 to 18, by the fact characterized that the single grain dosing apparatus (4) is preferably tiltable out-arranged and in the lagging a grain (15) sucks in by means of a suction nozzle (22) and inserts by a tappet (23) into the pre-determined ranges (21) of the base layer (50).

20. Device after one of the requirements 10 to 19, by the fact characterized that second and/or the third zone at least one departure roller (6; 12) exhibits.

21. Vorrichtung according to requirement 20, by the fact characterized that the lateral surface of the departure roller (6; 12) Slots (52) exhibits, which in would face itself to the seed-good-equipped ranges (21) find.

22. Device after one of the requirements 10 to 21, by it characterized that winding disks (14) are intended for the keeping of the seed volumes, as well as a separating equipment (11), the seed volumes in certain lengths partitions.

23. Device after one of the requirements 10 to 22, by the fact characterized that in transportation direction regarded before the single grain dosing apparatus (4) a punching mechanism (20) is intended.

24. Device according to requirement 23, by the fact characterized that a spacer layer (2) of the punching mechanism (20) locates for production the seed property (19) taking up ranges (21) is supplied, whereby then the spacer layer (2) forms the base layer (50) after punching out by applying on a base (1).

25. Device after one of the requirements 10 to by the fact 24 characterized that the further transport of the layer group and/or. the base layer (50) cyclically takes place.

26. Device after one of the requirements 10 to 25, by the fact characterized that the cutting tool (9) is adjustable to the longitudinal axis of the seed volume.

27. Device after one of the requirements 10 to 26, by the fact characterized that the cutting tool (9) is a squeezing measurer.